Saskatchewan Ministry of Agriculture

CROP PRODUCTION NEWS

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PRODUCTION

Editor's Comments

Ray McVicar, Crop Development Branch (Ray.McVicar@.gov.sk.ca)

Welcome to another growing season in Saskatchewan! We've had positive responses to the *Crop Production News* (CPN) in the past, and we are pleased to continue publishing in 2008. The objective of the CPN is to highlight timely information on crop production issues that you may see in the field as the season progresses. We would very much like to hear from you, so please let us know what's happening in your area regarding pests or crop production issues.

Sean Miller and I will be compiling and editing the CPN this year. We also have a new name and website address. To check out the Saskatchewan Ministry of Agriculture website, please click on www.agriculture.gov.sk.ca. For an update on provincial crop progress throughout the growing season, see the weekly Crop Report at www.agriculture.gov.sk.ca/Crop-Report.

We've had a slower start to the growing season this year with good soil moisture conditions in the central and northern regions, and very poor conditions in much of the south. Crop prices increased throughout the winter to levels that many of us have not seen before. The question on the minds of many crop producers is: "How can I produce a good yield to take advantage of these prices?" We hope to provide useful information in a timely fashion to help make the correct decisions on crop production.
The spring update to the *2008 Guide to Crop Protection* is now available on our website at www.agriculture.gov.sk.ca/Guide_to_Crop_Protection.

NOTE: Throughout this document you will see that some publications are in blue font and underlined, indicating links to website information. If you are reading this off your computer screen, press the CTRL button and click your cursor on the link to take you directly to the website. ✪

The ***Crop Production News*** is a biweekly publication prepared primarily by provincial specialists with the Crop Development Branch of the Saskatchewan Ministry of Agriculture. The newsletter includes a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.
Please do not use any of these articles for any other purpose without first asking the author's permission.

If you wish to be added to or removed from our mailing list, forward your request by e-mail to: Sean.Miller@gov.sk.ca

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Crop Protection Lab update

By Grant Holzgang, Laboratory Supervisor, Crop Protection Lab

We welcome Brianna Brown as our Dutch Elm Disease Technician for May to August 2008.

The Crop Protection Laboratory processed 126 herbicide resistance samples during the winter months: 103 samples were wild oats. We tested 77 wild oat samples for Group 1 resistance only; 24 for Group 1 and 2; and two for Group 2 only. For Group 1, 88 were resistant; eight were susceptible; and nine had inadequate germination. For Group 2, 21 were resistant, four were susceptible, and one had inadequate germination.

We tested four cleavers samples for Group 2 resistance: two were found to be resistant, and two were susceptible. We tested nine green foxtail samples: two were resistant to Group 1; one was susceptible to Group 2; one was resistant to Group 3; two were susceptible to Group 3; and five had inadequate germination. The lone kochia sample we tested was resistant to Group 2, and the Russian thistle sample tested was susceptible to Groups 4 and 6. We tested eight wild mustard samples; seven were resistant, and one was susceptible to Group 2.

The Crop Protection Lab began a new program this winter with many samples of poplar cuttings from a survey of Alberta stool beds, and a sample from a supplier in Prince Albert. The most common pathogen was *Marsoninna* twig blight and the most significant canker causing fungus was *Septoria musiva*. Other pathogens of some significance included *Venturia*, the cause of twig blight; *Cytospora*, a common canker causing fungus; and *Mycosphaerella*, the ascomycete state of *Septorias*, the causal agents of leaf blight and canker. This program is expected to continue with in-season samples this summer. The impact of these pathogens is of significance because poplar is seen as an alternative source of fibre and ethanol production.

We are presently working on strawberry crown material from California to determine if there are any pathogenic nematodes present. This is done to guarantee that we are not introducing any pathogens into Saskatchewan fields, and to assure that crowns recovered in the fall will be free of nematodes that could restrict their flow to California or Florida.

In April we dealt with some greenhouse samples for disease, household insects, and a Japanese brome seedling for identification. There has been little to report from the fields yet. ☼

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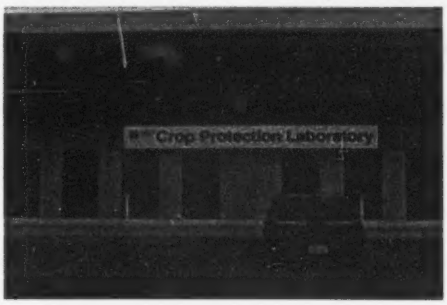
Crop Protection Laboratory



The primary role of the lab is to identify plant diseases, insects and weeds, and to perform herbicide resistance testing of weed seeds.

The laboratory staff is happy to assist you on all plant related matters. Fulltime staff members include: Grant Holzgang, Lab Supervisor; Tony Stoppa, Senior Lab Technician; and Carla Weitzel, Plant Health Technician.

The Dutch Elm Disease Technician (summer position) is Brianna Brown.
Dutch Elm Disease Hotline 1-800-SASK-ELM.

For more information: Check the Saskatchewan Agriculture website at www.agriculture.gov.sk.ca/programs-services
(Scroll down and Click on Crop Protection Lab Services) or phone the Agriculture Knowledge Centre at 1-866-457-2377

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Don't skip phosphate starter fertilizer

By Ken Panchuk, Provincial Soils Specialist

Crops require adequate levels of phosphate during early growth. Phosphate has a major positive impact on early root growth, especially under cool soil conditions. The second major positive impact of phosphate occurs at the tillering stage of cereal grains, where phosphate increases tiller initiation. Starter phosphate needs to be banded with or near the seed for optimum, early uptake.

JumpStart, a phosphorus solubilizing inoculant, is active under cool soils making phosphorus available during early crop growth.

Other macronutrients that are determined to be deficient by a soil test also need to be added in the correct amounts to form a balance of nutrients for optimum crop health and productivity. ☼

Insects to watch for in 2008

By Scott Hartley, Provincial Insect Specialist

Wireworms and **cutworms** are likely to be some of the first insect pests affecting seedlings in the spring. Both are usually below ground feeders, but some cutworm species will feed above ground causing defoliation of the young plants. A notable example of foliar feeding species was the dingy cutworm that caused extensive damage in a number of canola and lentil fields across southern Saskatchewan in 2007.

While wireworms can exist in immature developmental stages in the soil for a number of years, cutworms have an annual life cycle. Their feeding habits also differ.

Wireworm damage can be identified as lesions or a shredding of the seedling below the soil surface resulting in wilting and eventual mortality of the plant. Cutworms generally cut the seedling off at or below the ground surface.

Wireworms tend to be more prevalent in cool moist soil, often in low-lying areas of a field. Cutworms prefer warm, dry soils and may be more common in well-drained or hilly areas of a field.

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Insects to watch for in 2008 **(Continued from page 4)**

Control of wireworm is through seed treatments applied prior to planting. Thiamethoxam, the active ingredient in Cruiser is currently the only registered seed treatment for control of wireworms. It can be applied only by commercial seed treaters with closed system facilities.

Regardless of the cutworm species, control recommendations are the same. Depending on the crop, there are foliar insecticides registered for control of cutworms. Refer to the *2008 Guide to Crop Protection.* In spring cereals, three to four cutworms per square metre is considered to be the economic threshold. Insecticides should be applied to the soil surface in the evening. Cutworms are nocturnal feeders. They come to the soil surface to feed and that's where they come into contact with the insecticide. Higher water volumes can be beneficial for better coverage and soil penetration. It can take up to 10 days for optimum results, as not all larvae will come to the surface on any given night.

Wireworm survey

If wireworm infestations are noted, live specimens of the larvae or adults can be submitted to the Crop Protection Lab in Regina and will be forwarded to Agriculture and Agri Food Canada (AAFC) for identification and inclusion in a Canada-wide survey. There is no charge associated with this sample identification. Samples should be submitted in sealed containers with the date of collection, land description, crop and soil type noted.

Cabbage seedpod weevil

The cabbage seedpod weevil was a major pest for canola growers around and west of Swift Current in 2007. Distribution of the cabbage seedpod weevil continues to expand out of southwestern Saskatchewan. Host plants of the cabbage seedpod weevil are all members of the mustard family. Canola and brown mustard are most affected. Yellow mustard is resistant to the weevil.

Pea leaf weevil

Pea leaf weevil infestations were noted in pea crops in Saskatchewan for the first time in late May 2007. Although the actual beetles are difficult to find, their distinctive damage was identified in some pea crops during a field survey and samples submitted to the Crop Protection Laboratory from the Maple Creek area.

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Insects to watch for in 2008 **(Continued from page 5)**

The pea leaf weevil has an annual life cycle, over-wintering as an adult in roadsides, alfalfa fields, grasslands and vegetative debris. The weevils emerge as temperatures warm in the spring. They seek food, primarily pea, but also feed on alfalfa, vetch, beans and clover. The adult weevils fly at temperatures above 15 C. Eggs are usually laid in late April and May in the soil or on plant tissue. Upon hatching, the pale, grub-like larvae feed on the nitrogen-fixing rhizobium nodules on the roots. Typical feeding results in scalloping of the leaf margins.

The pea leaf weevil is a nocturnal feeder hiding in cracks in the soil during the day. The adult weevil has a short snout, is grayish brown and about five millimeters (mm) in length, with three light stripes on the thorax and hardened wing covers (elytra) on the abdomen. Due to its feeding habits and colour, it is difficult to find the weevil in the soil during the day.

Seed treatment is an option for producers in 2008 if infestations were noted in 2007. An Emergency Use Registration (EUR) was granted to the Saskatchewan Ministry of Agriculture and Alberta Agriculture and Rural Development for Cruiser 5FS and Cruiser Maxx Bean insecticide seed treatments for control of pea leaf weevil in pea. This EUR is valid until Dec. 31, 2008. These products are available to commercial seed treaters only.

Infestations may also be controlled with a foliar-applied insecticide. Damage to leaves is the best way to determine economic levels. The sample should be at least 10 plants at a minimum of five locations at the edge of the field and at about 100 metres into the field. The current level at which control should be considered is when at least one out of three plants show damage on the terminal leaves. Control measures appear to be most effective if an insecticide is applied prior to the fifth to sixth node stage of the crop. Matador is the only registered product for foliar application and the mode of action is primarily through contact. Application should be made in the evening, although good results can be achieved during the day if temperatures are between 10 and 25 C. The lower temperature is to ensure the weevils are active and the higher limit is due to reduced efficacy of Matador, a synthetic pyrethroid, at high temperatures.

Grasshoppers

The *2008 Saskatchewan Grasshopper Forecast* map suggests that grasshopper populations are of low risk for most areas of the province in 2008. However, warm, dry conditions will favour grasshoppers and producers should keep in mind that economic thresholds vary between crops. Lentil crops, particularly field margins, are at risk even at low levels. The economic threshold for grasshoppers in lentil is two per square metre.

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Insects to watch for in 2008 **(Continued from page 6)**

A new booklet, *Grasshopper Identification and Control Methods* by Dr. Dan Johnson of the University of Lethbridge was released in late April. Copies are available through the Agriculture Knowledge Centre in Moose Jaw. This publication was funded by the Pesticide Risk Reduction Program, Pest Management Centre, Agriculture and Agri-Food Canada. It was produced in collaboration with Pulse Canada and the Saskatchewan Ministry of Agriculture.

Wheat midge

The *2008 Wheat Midge Forecast* map indicates the potential of high risk from wheat midge throughout the moist dark brown, black and gray soil zones. There are a number of proactive management options that should be considered. Keep in mind that monitoring will be critical in making control decisions. Therefore, large areas of wheat will require substantial in-field scouting if wheat is in a susceptible stage (when the wheat head becomes visible as the boot splits until mid-flowering) and the adult midge are flying.

If it is an option in a current rotation, consider growing a non-susceptible cereal crop (e.g. oats, barley) or a broadleaf crop (e.g. canola, pulse crops).

If wheat is grown in a high-risk area:

- Avoid planting wheat on wheat stubble.
- Seed early and select early-maturing varieties.

It is advantageous for monitoring and control operations if the crop growth stage is similar throughout the field. Therefore:

- avoid planting wheat in fields with very uneven terrain, and
- seed at higher rates to reduce tillering. The primary stem and first two tillers are usually the main yield components of a wheat plant. More tillers will result in a longer time in which the crop will have wheat heads susceptible to wheat midge damage.

Bertha armyworm

Following severe outbreaks of bertha armyworm in 2005 and 2006, infestations decreased in 2007. This trend is expected to continue with further reduced risk to crops (canola, flax and mustard) in 2008.

A pheromone trap monitoring program for bertha armyworm moths is being set up again in 2008. Previous co-operators are being contacted for participation in this year's program. Pheromones, insecticide strips and replacement parts will be sent out to co-operators at the end of May with setup and data collection commencing in early to mid-June. Data from 200 to 300 traps across the province will be compiled in map form, and posted with weekly updates on the Ministry website. The toll-free contact number for the bertha armyworm monitoring program for 2008 is 1-888-323-7842. ✿

Clubroot of canola

By Faye Dokken, Provincial Plant Disease Specialist

This could be a record year for canola across the prairie provinces. Growers in Saskatchewan are expected to seed up to 7.5-million acres, according to the first Saskatchewan Crop Report of 2008. Increased acreage means more ground to cover when scouting for canola diseases, such as blackleg, sclerotinia stem rot, fusarium wilt, and aster yellows. It is important to further investigate any suspicious stunting, wilting, and yellowing of canola during late rosette to early podding, or premature ripening at later stages. The cause may be a familiar disease or perhaps a result of drought conditions or a nutrient deficiency. However, it is important to rule out another impending disease threat known as clubroot.

Clubroot is soil-borne disease caused by a fungal-like protist that infects roots of crucifers. The pathogen overwinters as resting spores, which can survive in soil for up to 20 years. Spore germination, infection, and disease development are favoured by warm soil temperatures, high soil moisture, and acidic soils. Invasion of the interior of host roots alters hormone balance and leads to increased cell division and growth, resulting in characteristic clubroot galls. These deformed roots have a reduced ability to absorb water and nutrients. The cause of above-ground symptoms can be determined by digging up suspicious plants to check roots for gall formation. Clubroot affects yield and quality of canola, by negatively affecting water and nutrient uptake. Infected roots will eventually disintegrate, releasing resting spores back into the soil, which are then transported by wind, water erosion, attachment to plant parts, or earth tag on agricultural or industrial field equipment.

Clubroot is a disease that affects crucifers worldwide. It was first reported on canola in Canada in 2003, when it was identified near Edmonton. Since then, clubroot has been confirmed in 11 counties in Alberta, and was declared a pest under Alberta's Agricultural Pests Act in 2007. There is no economical or practical method for controlling clubroot at this time.

Photos courtesy of Stephen Strelkov (left) and Kelly Turkington (right).

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Clubroot of Canola **(Continued from page 8)**

Without resistant varieties or registered fungicides, it is even more important to prevent establishment and spread of clubroot in Saskatchewan, where it has not yet been found. This means avoiding seed from infected regions, and ensuring agricultural and industrial field equipment has been properly cleaned and sanitized. **Scout canola fields diligently this summer and contact Saskatchewan Agriculture if you suspect clubroot.**

Frequently Asked Questions are now available on the Saskatchewan Agriculture website at www.agriculture.gov.sk.ca/Clubroot_Disease_Canola.

For more information on clubroot, and recommended preventative measures, please visit this website or contact the Agriculture Knowledge Centre at **1-866-457-2377**. ✿

Inoculation failure on dry soils

By Dale Risula, Provincial Special Crops Specialist

Products containing *Rhizobium* bacteria are called nitrogen inoculants. Inoculation is the process of introducing the appropriate *Rhizobium* bacteria to the soil in numbers sufficient to ensure successful nodulation. This is done by coating the seed with a liquid or peat-based powder inoculant, or by treating the soil with a granular or liquid inoculant. Commercial inoculants, when properly applied, ensure that every plant is exposed to a sufficient number of bacteria to initiate nodulation and start the nitrogen fixation process. *Rhizobium* bacteria are not very mobile in the soil, and thus, the inoculant must come in contact with the developing seedling for infection of root hairs to occur.

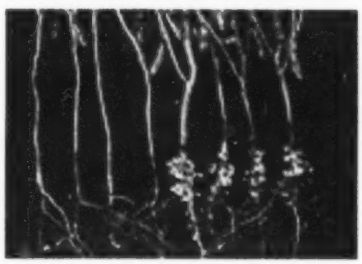

Figure 1. Nodule formation on pea crop. Source: University of Saskatchewan.

Nodule formation may begin approximately two weeks after crop emergence, but will likely take three to four weeks under most growing conditions. The number of nodules and rate of fixation will increase as the plant grows, and normally reaches a maximum at the mid-flowering stage to correspond to the time when the plant needs the most nitrogen. After flowering, the number of nodules and the amount of fixation declines as the plant progresses to maturity.

Successful nodulation and fixation can be determined by carefully digging up (not pulling) plants from several areas of the field. The nodules are delicately attached to the roots and can be easily brushed off. Gently brush or wash the soil from the roots and look for clumps of nodules on the roots (Figure 1).

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Inoculation failure on dry soils **(Continued from page 9)**

Carefully slice open the nodules. The interior of nodules that are actively fixing nitrogen are pink to beef-red in colour (Figure 2). This colour is due to the presence of a substance called leghaemoglobin, an iron-containing pigment that must be present for active fixation. If the inside of the nodule is brown, white or green, the nodule is not effective.

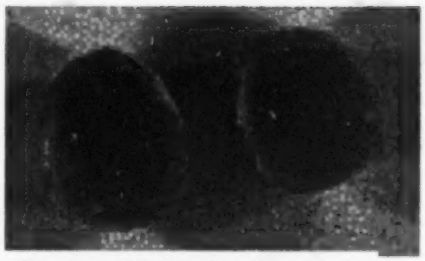

Figure 2. Nodule sliced open to show red colour. Source: University of Saskatchewan.

If careful inspection of the pulse crop root reveals little or no nodulation, inoculation may have been ineffective because of adverse conditions such as dry soils. If the field has a history of the same pulse crop, residual *Rhizobium* bacteria present in the soil may initiate enough nodulation to meet nitrogen requirements for a moderate yield.

If further inspection proves that nodulation has not occurred, and deficiency symptoms appear, a top-dressed application of nitrogen fertilizer may be an option. Limited information is available for recommendations for Saskatchewan growers, so the decision on the amount and formulation of fertilizer to be applied should be made after careful consideration.

Submit crop tissue samples to a soil test laboratory to determine nutrient levels present in the plant. The laboratory will provide instructions for the proper collection and packaging of the samples. Tissue samples should be taken as soon as possible in the growing season and prior to first bloom. The laboratory will work with the producer to determine the course of action to be taken, based on local moisture conditions and target yields.

Fertilizer applications should take place as early in the growing season as possible. Supplemental nitrogen should not be applied later than approximately six weeks after emergence of the crop, as it may cause excessive vegetative growth, poor pod set, and delayed maturity. In research carried out on pea and chickpea in Montana in 1999 and 2000, fertilizer was applied after crop emergence to overcome nitrogen deficiency due to inoculant failure. Their conclusions indicated that yield loss due to inoculant failure could be prevented by applying fertilizer within six weeks of seeding, coinciding with the nine to 12 node stage of pea and the 10 to 13 node stage of chickpea.

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Inoculation failure on dry soils **(Continued from page 10)**

Nitrogen fixation is a biological system that requires the plant and *Rhizobium* bacteria to work in balance. Some conditions that cause nitrogen fixation failure include:

- Using the wrong species of *Rhizobium* for the crop seeded, or using inadequate rates of inoculant. Calibrate seeding equipment using inoculated seed as it may have slower flow rates than seed that has not been inoculated.
- Delays between inoculation and seeding. The bacteria die rapidly when exposed to temperature extremes and drying conditions. Ideally, inoculate only enough seed that can be planted within six hours. Under cool, dark storage conditions, bacteria can survive on seed for about one to two days, depending on the inoculant formulation. Any further delay will require retreating. Check product labels for manufacturer's instructions - some liquid products must be reapplied if the treated seed is held longer than six hours.
- Improper inoculant storage conditions. High temperatures or exposure to sunlight can kill the bacteria. This can occur in a short period of time, such as during transport or inside a warm vehicle. Inoculants should always be kept cool and out of direct sunlight.
- Environmental conditions (cool soil, waterlogged soil, drought stress or salt stress) that slow crop development and reduce the ability of the plant to supply energy and nutrients for nodule formation and fixation. Plant stress may result in delayed nodule formation and cause the fixation process to stop.
- Dry soil during the first two weeks after seeding can lead to desiccation (drying out) of the inoculant and death of the *Rhizobium*.
- Shallow seeding into soil that dries out periodically after seeding may lead to the desiccation of the *Rhizobium*. ✿

Links and Additional Information:

Pulse Crop Inoculant Product Information:
www.agriculture.gov.sk.ca/Production (Click on **Crops - Fertilizer/Nutrients,** and then scroll down and click on **Pulse Crop Inoculant Product Information)**

Soil Improvements with Legumes:
www.agriculture.gov.sk.ca/Production (Click on **Crops - Fertilizer/Nutrients,** and then scroll down and click on **Soil Improvements with Legumes)**

Pulse Production Manual: www.saskpulse.com/

Inoculation of Pulse Crops: www.agriculture.gov.sk.ca/Inoculation_Pulse_Crops

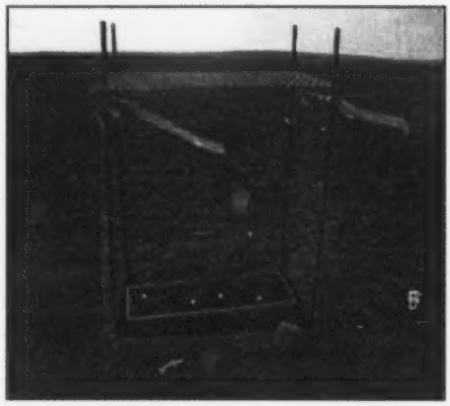
Ascochyta on chickpeas – Sentinel Plant Project 2008

By Faye Dokken, Provincial Plant Disease Specialist and Dale Risula, Provincial Special Crops Specialist

This year marks the second season of the Chickpea Ascochyta Sentinel Project. This project has been designed to develop an early-warning system for ascochyta of chickpea, to aid in timing of the first and highly critical fungicide application. The objective is to determine the first release of *Ascochyta rabiei* spores by placing pre-grown susceptible chickpea plants near inoculum sources in chickpea residue. These sentinel plants are then returned to the lab to promote symptom development and determine disease risk.

Reports will be sent to volunteer agronomist and grower co-operators twice a week for the duration of the project.

If you're interested in participating in the project as an agronomist or grower co-operator, please contact Faye Dokken at faye.dokken@gov.sk.ca or phone (306) 787-4671.



Sentinel plant cage.
Photo: Saskatchewan Agriculture.

Agronomist and grower co-operators will be expected to:

- Check their email/fax on a twice weekly basis for updates on ascochyta disease status. Agronomist co-operators extend information out to chickpea growers in their region.
- Grower co-operators allow for their chickpea field to be surveyed during the season for ascochyta blight severity (by Saskatchewan Agriculture and Agriculture and Agri-Food Canada (AAFC) staff, retail agronomists), and are welcome to participate in the surveys when available.
- Know where the sentinel trap lines are in their region and remind growers to protect these sites.
- Attend a mid-summer field day to view the program.
- Grower co-operators agree to share their fungicide spray records, including timing, water volumes, rate and product used. Agronomist co-operators treat the information coming from the growers as confidential.
- Agree to be interviewed at the end of the season so that we can assess whether or not the program was instrumental in timing or amount sprayed.☼

Early lesion. Photo: Saskatchewan Agriculture.

Careful planning crucial when seeding forage stands during dry conditions

By Michel Tremblay, Provincial Forage Specialist

Establishing forage stands requires careful planning to obtain the best results and maximum production during the stands lifetime. Species selection, seeding method, and timing, are all important factors to consider.

Forage species have considerable differences in drought tolerance and establishment ease. These differences should be considered when seeding forage in a drought prone area or planting into a seedbed that is moisture limited. The drought tolerance champ is crested wheatgrass. It has excellent drought tolerance and has reliable establishment characteristics and yield, even under harsh conditions. Its limitations are that it makes poor summer pasture and its forage quality is not as good as most other forage species. Russian wildrye and altai wildrye also have excellent drought tolerance when established. Caution is required when establishing these species, however, as they are notoriously slow establishers, making them risky bets to seed during dry conditions.
Smooth and meadow bromegrass have good seedling vigour, but production is significantly reduced under dry conditions. Intermediate wheatgrass is a good establisher, but performs better in the dark brown and black soil zones due to marginal tolerance to extended periods of drought. Alfalfa is an excellent establisher and is able to exploit moisture reserves deep in the soil due to its extensive root system.

Weed control prior to planting forages is critical, as forage seedlings do not compete well with weeds. Effective pre-emergent weed control is desirable, as in-crop weed control options are limited and are usually expensive. Forages seeded under dry conditions often have delayed emergence, which can allow weeds to get ahead of the forage. Mowing weeds when they elongate, but prior to seed set, is an effective way to reduce competition and reduce weed seed production.

Depth control is crucial to successful establishment of forage species. Photo by Michel Tremblay, Saskatchewan Ministry of Agriculture

Forages need a firm, fine, seed bed for optimum seed placement, seed-to-soil contact, and subsequent germination. Dry soil conditions make packing the soil difficult. Minimizing soil disturbance prior to seeding reduces loosening of the seed bed, and also conserves moisture – a critical consideration when seeding forages.

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Careful planning crucial when seeding forage stands during dry conditions
(Continued from page 13)

Seeding depth is an important factor to consider.

Seeding "to moisture" is not an option with forages, as planting at depths deeper than 2.5 centimetre (cm) or one inch significantly reduces emergence. When surface moisture is absent, seeds are dependant on a rainfall event to germinate. Forage seedlings are vulnerable to drought conditions directly after a rainfall event. If the seed germinates but the soil dries out rapidly, before the root can extend into subsoil moisture, a seeding failure will result.

Use of a cover crop when seeding forage is a common practice in Saskatchewan. Generally, cover crops compete with forage seedlings for moisture, nutrients and light. Avoid using a cover crop when seeding under dry conditions.

Forage seeding requires thorough planning, particularly when moisture is limited. Careful selection of species, weed control, and seedbed preparation will maximize the probability of successful establishment. The use of cover crops should be avoided if dry conditions are prevalent at planting. Due to delayed germination under adverse conditions, the decision to reseed a field seeded to forages that doesn't appear to have established should not be done until the spring after seeding.☼

Herbicide Risks in Spring 2008

By Clark Brenzil, Provincial Weed Control Specialist

Every season presents some challenges for herbicide performance. This article highlights the points to keep in mind when going into a spring where weather conditions are quite variable from one part of the province to the next.

Glyphosate performance depends heavily on the active ingredient moving from the surface of the leaf to the meristematic tissues where it will inhibit further growth. Because of glyphosate's attraction to organic matter, even under very good conditions for activity, only a very small proportion (three to five per cent) gets to the target tissues. The rest is bound by inert matter in the plant and made inactive. Because of this, the bulk of active glyphosate needs to reach its target sites within 24 to 48 hours of application. A small amount of glyphosate will circulate up to 72 hours but this has limited significance to control of the target weeds.

Movement of glyphosate within the plant uses the same pathway as sugars produced in the leaves during sunlight hours and circulated through the phloem. While growing conditions are good, during periods of high sunlight levels and warm moist conditions, glyphosate moves quickly from leaf to growing points and performance is excellent.

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Herbicide Risks in Spring 2008 **(Continued from page 14)**

When growing conditions are poor, during periods of overcast and/or cool weather, the movement of sugar is slowed and with it the movement of glyphosate. This delay in glyphosate movement increases the opportunity for glyphosate to be bound to inert material and made unavailable for herbicidal activity.

Glyphosate is also self-limiting with respect to translocation through the plant. Shortly after application, glyphosate's herbicidal effect halts biological activity in the target leaf. Circulation of material out of the leaf, including glyphosate, stops. This is another reason it is important for the glyphosate to get to its target as quickly as possible.

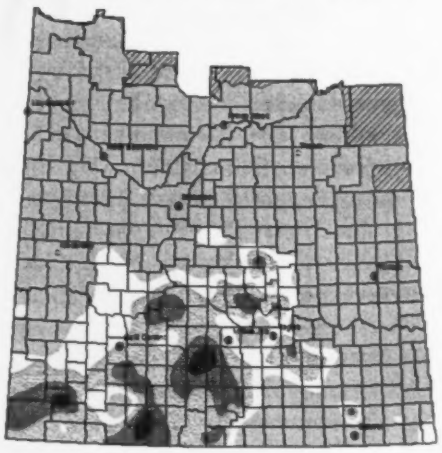
Under poor growing conditions, glyphosate remains in the leaf, and while it appears initially that control is good, the target weeds begin to grow again from buds that were not exposed to the glyphosate. The key to getting good activity from glyphosate, or other systemic herbicides, is to apply them under sunny, warm conditions where moisture is not limiting.

Biological activity in plants is largely stopped at temperatures below 5 C. If night-time temperatures drop below this level, it will take time the following day to re-establish adequate biological activity for good herbicide translocation. Most systemic herbicides recommend a period of 48 to 72 hours of good growing conditions following a frost before applying.

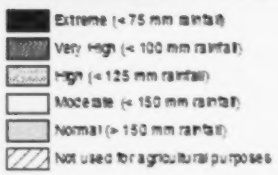
Excessive soil carryover of residual herbicides is another challenge that producers encounter each spring. The attached maps (right) are rainfall records from the 2007 growing season.
The first map shows precipitation measured in an earlier portion of the season than the second map.

(Continued on page 16)

Precipitation: June 2 to Sept. 1, 2007



Precipitation: June 16 to Sept 15, 2007



Herbicide risks in spring 2008 **(Continued from page 15)**

Crop protection companies use different time frames and rainfall levels as indicators of risk of herbicide carryover for their products. The 2007 season was characterized by cool wet conditions early in the season followed by hot and dry conditions beginning roughly on July 1. This would suggest that later herbicide applications may be at higher risk of carryover than earlier applications.

These maps are created using rainfall data collected by the Ministry of Agriculture's crop reporter network and should be used only as a rough indicator of risk. Rainfall records for individual fields will better indicate the absolute risk of seeding marginally tolerant crops. Consult with the manufactures of the residual herbicides for a better understanding of risk and sensitivities of crops.

The second map also has dots that indicate where the data was collected. Additional Crop Reporters are needed to fill in some of the gaps. For more information, contact Terry Bedard at 787-5947, or visit www.agriculture.gov.sk.ca/Agriview_April_08_22 .

For more information on residual herbicides, see page 53 of the *2008 Guide to Crop Protection* at www.agriculture.gov.sk.ca/Guide_to_Crop_Protection.

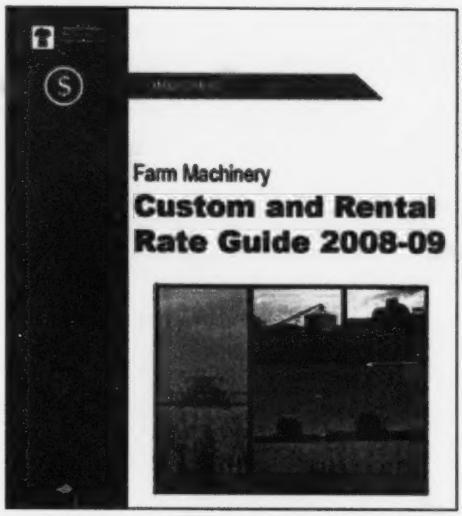
Also at this link is the Spring Update to the *2008 Guide to Crop Protection* that provides updates on new registrations that have taken place since the printed *Guide* was published. For more information on the impact of dry weather on herbicide performance see *Herbicide Considerations for Dry Conditions* on the Ministry of Agriculture web site www.agriculture.gov.sk.ca/Production. Then click on Crops – Weeds, and scroll down to *Herbicide Considerations for Dry Conditions.*☼

Do you have more questions about crops, livestock, nutrient management or farm business management?

Contact friendly and knowledgeable staff at the
Agriculture Knowledge Centre
Toll-free helpline **1-866-457-2377**
Or visit the Saskatchewan Agriculture website
at www.agriculture.gov.sk.ca

Farm Machinery Custom and Rental Rate Guide for 2008 now available

By Ray McVicar, Crop Development Branch



The *Farm Machinery Custom and Rental Rate Guide 2008-09* is now available on the Saskatchewan Ministry of Agriculture website at www.agriculture.gov.sk.ca/Financial-Planning (Scroll down and click on **Farm Machinery Custom and Rental Rate Guide.**) The publication was recently updated and reflects equipment costs as of the end of March 2008.

The guide gives detailed information regarding ownership, operating costs, custom rates and rental rates for farm machinery.

The *Guide* is meant to help producers calculate their equipment costs and how much they might charge for doing custom work. The calculations estimate equipment expenses including fuel, opportunity costs, depreciation, repairs and a 15 per cent profit margin. Those not wishing to charge a profit can reduce the price by 15 per cent to get a breakeven price.

Custom operators may need to complete more thorough calculations of cost and profit levels because the *Guide* is based on the number of hours that a typical farmer would use machinery. Expenses such as liability insurance, advertising, shop equipment and transportation costs are not included.

Whether doing some work for a neighbor or operating a custom business, it is strongly recommended to agree on the rate before doing the work to avoid later disagreements.

The Farm Machinery Custom and Rental Rate Guide 2008-09 is not a report on the current market rate for custom operations. It is not a survey of the market and cannot be used or quoted as "the going market rate."

It is important to compare the *Guide's* calculated rate to the local market rate. If the market rate is significantly below the cost of operation, doing custom work may not be worthwhile.

For a copy of the *Guide*, visit the Saskatchewan Agriculture website or contact the Agriculture Knowledge Centre at 1-866-457-2377. ✿

The ***Crop Production News*** is a regular publication of the
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